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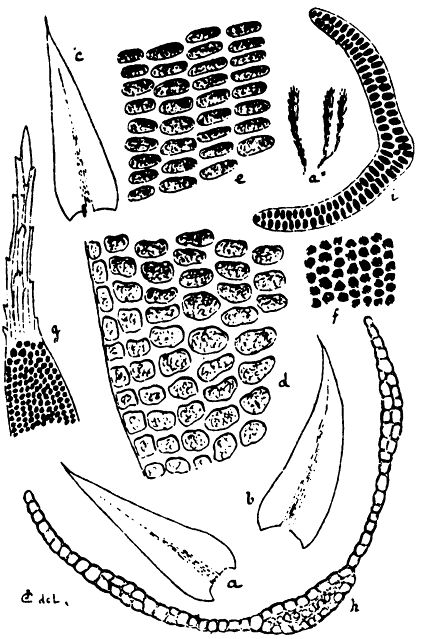
belongs becomes apparent. Turning then to the third part of the Key, he observes the general aspects of the plant, color, texture, relations of the plant to substratum, cellular structure, habitat, etc., and with the accompanying illustrations to aid finds its specific name. The thalloid liverworts are first examined with regard to the shape of the thallus, whether the dorsal side possesses stomata or gemmae, and whether there are scales on the ventral side: the shape and placing of the involucre, whether immersed, sessile or stipitate ; the shape of the opened capsule. The species of the family Ricciaceae are illustrated with outline drawings of the whole plant and with cross-sections of the thallus: while the species of the genus Fossombronia are determined by the characteristic markings and shape of the spores. There are two hundred and fourteen species given. So many of the French species are also inhabitants of America that this quarto should prove serviceable to our own students of the Hepaticae. Caroline Coventry Haynes.

GRIMMIA GLAUCA.—A NEW SPECIES OR A HYBRID.

John M. Holzinger.



From Cardot's illustration in Revue Bryologique.

Under this title Mr. Jules Cardot, in Rev. Bryol. 1905, p. 17, discusses and describes a sterile Grimmia found by him and Mr. Longuet near Charleville, in the Ardennes, northern France. On Aug. 23, 1905, the writer collected a sterile Grimmia on a ledge of lime rock left exposed by the general glacial mantle, and strewn with detached boulders of the same material, standing above the general level of the prairie, three miles due south of Lewiston, Winona County, Minn., about twenty miles from Winona, on the C. & N. W. Ry. The plants occurred quite abundantly, in loose cushions one to three inches in diameter. Their appearance suggested *G. leucophaea*, which was collected by the writer at Taylor's Falls, on the eastern border of Minnesota, and in the valley of the Upper Minnesota River, both at Montevideo and at Ortonville, on the western border of the State. But it was recognized, even in the field, that these plants were smaller than the known species. Microscopic examination proved them quite different, nor could they be referred to any described species, so far as there was time for comparison.

Under the circumstances it was deemed advisable to submit some of this material for critical study to Mr. H. N. Dixon, who on previous occasions had kindly taken the trouble to examine other Grimmias. Being recognized as an able and conservative bryologist, his judgment deserves to be put on record. He says of this plant:

"The leaf base and general appearance are precisely those of *G. leucophaea*, from which I think it differs only, but very markedly, in the tapering points of the leaves. In fact it is almost identical with *G. glauca* Card., only differing in the larger, very rough hair points. It constitutes in fact an intermediate stage between that plant and *G. leucophaea.* And some of your plants have the leaves slightly less tapering, and therefore still more like the latter plant. I would suggest that you send a specimen to M. Cardot; I think he will be interested to see it. I am inclined to think that it somewhat confirms his suggestion that *G. glauca* may be a hybrid resulting from a crossing of which *G. leucopheae* is one parent."

The writer accordingly sent both the letter, from which the above extract is taken, and some of the Grimmia in question to Mr. Cardot, who writes: "Your Grimmia is clearly my *G. glauca*, as Mr. Dixon thought. It differs from the type from Charleville only by its longer, stouter, rougher hair point, and also by its less glaucous color. But there is no doubt about its being this plant. Is this a hybrid, or a species? This question will probably remain unanswered so long as the fruit is not found."

Sterile Grimmias are at best difficult to determine, usually requiring the examination of leaf sections, both near the base and apex. In the case of the moss in question, it has, therefore, seemed advisable to make accessible to all interested bryologists the independent judgment of the two students above quoted, both well known for their ability and achievements.

It appears that neither in Mr. Dixon's nor Mr. Cardot's judgment there is so far decisive evidence that this is either a good species or a hybrid, unless the recognized variation, in the Minnesota plant, of the stouter and frequently longer hair point may be held to lead to the view that it really is a hybrid. In the face of this uncertainty the writer ventures to suggest that the geographical distribution of the plant—its occurrence in two isolated areas, one in Northern France, the other in the Upper Mississippi basin, on a knoll in Southeastern Minnesota—tends to argue for its value as a good species. It should be recalled, in this connection, that Winona County lies in the northwest portion of the Driftless Area. This Area, as the writer has shown in a former note, harbors *Grimmia teretinervis* Limpr., not known again till one reaches the Austrian Alps, *Claytonia Chamissoi* Ledeb., a thousand miles to the east, and 4000-5000 feet below its normal home in the Rocky Mountains, and other plants of similar remarkable distribution. The addition of *Grimmia glauca* Card. to this list of plants marooned, as it were in the Driftless Area, in the penumbra of which lies Winona County, is thus a matter of interest both geographical and botanical. It also constitutes an argument for the specific value of Mr. Cardot's plant, unless it be admitted that a hybrid may exist, and persist, for several thousand, even several times ten thousand years, in such widely separated areas. And further, the substratum for *G. leucophaea*, so far as the writer's observations go, is trap and granitic rocks; *G. glauca* occurs *here* on the sedimentary dolomitic limestone of Lower Silurian age. Nor yet could hybridization have taken place, at least so far as the American station goes to show: the knoll near Lewiston, E. Minn., is over a hundred miles from either of the Minnesota stations known to the writer. Whether the degree of isolation and substratum, of this plant of the French station, agrees with the above data, it will be interesting to learn from Mr. Cardot.

Following is Mr. Cardot's description translated from Rev. Bryol, 1905, pp. 17–18:

"Plants forming dense tufts or cushions, not cohering, of a glaucous green color when dry, of a lively green when moist. Stems simple or divided from the base, 5–10 mm. long. Leaves straight, closely imbricated when dry, lanceolate, long, and gradually tapering-acuminate nearly from the base, quite concave, channelled above, terminating in a short-toothed hair; about 2 mm, long, .6–.75 mm. wide; borders plane, quite entire; blade in all the upper portion, except on the borders, formed of two layers of small very chlorophyllose cells rounded or subhexagonal seen in a face view, but higher than wide seen in cross section; cells of the basilar portion in a single layer; at the angles are found numerous transversely enlarged cells, disposed in regular rows, becoming then square and passing gradually into the small cells of the upper leaf part; costa depressed, formed at the base in a cross section of two layers of the epidermal element analogous to the cells of the blade, between which is observed a layer, more or less developed, of smaller cells with thicker walls; the costa becomes indistinct towards the apex, where it is ordinarily reduced to a single cell lying between the two halves of the blade.

"By its leaves with plane margin, by its tissue, and by the structure of the costa, this moss evidently leans strongly toward *G. leucophaea*. But it is easy to distinguish the plant by the *shape of the leaves;* while in *G. leucophaea* they remain quite broad to near the apex, where they are *abruptly* narrowed into a very long hair, in *G. glauca* they are narrowed *gradually* and end in an elongated apex overtopped by a short hair. This last character, it is true, is not of great value, for forms of *G. leucophaea* with short hair points are quite frequently met with; but the *form* of the *upper part* of the leaf is quite distinctive, and does not permit of confusing *G. glauca* with *G. leucophaea.*"

Winona, Minn.

Miss A. L. Crockett, Camden, Maine, has discovered that through a misunderstanding at the Post-office a letter from a Sullivant Moss Chapter member to her was returned to the sender as unclaimed. If any others were similarly treated will they please write again.